

STRATEGIC ANALYSIS ON THE TRANSFORMATIONAL PROCESSES OF EDUCATIONAL SERVICES FUNDING: A MANAGERIAL AND ECONOMIC PERSPECTIVE FROM THE INTERNATIONAL SCIENTIFIC RESEARCH COOPERATION

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ABSTRACT

Funding is an integral part of educational development, which directly affects the economy. The introduction of innovative approaches to funding policy contributes to the further formation of an educational institution. Based on this, the main goal of the research is to strategically analyze the transformational processes of educational services funding related to the managerial and economic view of international research cooperation. Using the method of analysis, the work has revealed the mechanism of financial support for interstate research projects of Russian research centers in 2014-2020 and presented the author's vision of changes in this situation for the period 2021-2040. In particular, the paper indicates the impact on this factor development of events from 2014 to the present in the form of sanction wars with Russia and China from some Western countries, primarily the United States, as well as their retaliatory measures. The study found that during the period from 2013 to 2017, the investments received from the United States amounted to about 1.5 billion rubles. Finland took the last place with third lower indicators.

Keywords: Educational Services, Russia, China, International Research Cooperation, Financial Support.

INTRODUCTION

The processes of the world economy transformation cause the transformation of other areas of international engagement (Shanin, 2012). Among this aggregate, relations and interactions in the field of scientific research do not stand aside.

It is important to note that economic development trends depend on the education level in the country, since a high level of knowledge contributes to the creation of the any state's intellectual potential. The high level of the educational process effectiveness depends not only on the number of diplomas received, but also on the funding model, since education is a purposeful process of training and formation of each state's graduates.

Of course, earlier the main part of the education system was financed from public funds, at the same stage the requirements for education are increasing, which contributes to the introduction of innovative teaching technologies and the need for additional funding. The issue of introducing innovative technologies in education was especially acute during the pandemic since it was necessary to deviate from the traditional education system and get used to the online system. The main funding purpose is to strengthen the educational process, which allows getting greater interest of students and schoolchildren in learning, and as a result, getting high-quality specialists.

Throughout the world, the financing model is aimed at the socio-economic sphere and at obtaining the same opportunities and results for everyone, and in the Russian Federation the main part of funding is made up of public funds.

Sanction wars between Russia and Western countries, although not significantly, but still affected the level of international interaction between the countries, and as recent years statistics shows, this level continues to decline. At the same time, in recent years the People's Republic of China has continued to increase the level of interstate relations in various directions with most countries of the world, including Russia. Moreover, the Russian Federation is a leading partner in many of this cooperation parameters. In this article the authors present prospects and possibilities of this interaction in scientific specialization.

During educational services funding, a lot of problems also arise that are associated with the restriction of free disposal of finances, the lack of flexibility in education, an insufficient amount of specialized knowledge in attracting foreign investment. Thus, there is a need to revise the education financing model. Market relations contribute not only to an improvement in the education quality, the growth of graduates, and an increase in the profits of educational institutions, but also to serious control over invested funds. For example, in the UK, funding is provided not only for study programs, but also for students, since the investment level depends on the students' number and the study form. In France, investments in education have a significant advantage over other areas, and are supported not only by government grants, but also by partner organizations.

Based on the abovementioned, the main goal of the article is to perform a strategic analysis of the transformational processes of educational services funding, directly related to the managerial and economic view on international research cooperation.

LITERATURE REVIEW

Various scientists have studied educational program funding. Such authors like Chigarev (2019); Sklyarova et al. (2019); Taranova & Podkolzina (2019) devoted their works to the subject of history and current state of financial support to interstate research and development in recent years. The issues of the general influence of financial instruments on the development of scientific research, as well as their variety in form and instrumentation, were considered in the studies of Tatuev & Kerefov (2013); Shanin (2017); Tatuev (2008 & 2012); Tsindeliani (2019). The subjects of the sanctioned political influence of Western countries on the development of interstate scientific projects with scientific organizations of the Russian Federation are presented

in publications of Poleshchuk & Ridiger (2018a). Finally, the research of Guruleva & Bedareva (2019) is interesting among the studies in the field of the financial component of Russian-Chinese scientific projects during the last 5 years (Guruleva & Bedareva, 2019). The data sources for the research of Poleshchuk & Ridiger (2018b); Ridiger, 2018 & 2019) were official statistical compilations and materials of researchers and specialists working actively on collecting, analyzing, and adjusting the data generated from reports on the scientific activities of universities and research organizations. Large-scale projects of cutbacks to funding began for education and science support programs in Russia these years, which means that these projects that could be implemented within this European Fund in previous years were disapproved or frozen (Shvetsov & Kamnev, 2020). We can insist that in the coming years the first place in this rating will confidently remain for the PRC. The expansion of joint Russian-Chinese universities and faculties programs in the PRC will contribute to this in many ways, which will move undoubtedly from an educational to a scientific and educational form of functioning in the coming years (Guruleva & Bedareva, 2019).

Mayorga (2019) provides an analysis of the relationship between students, universities, and the economy, which shows the processes of students' transition from college to professional activity, describes the problems faced by students in universities, among which funding plays an important role.

A significant number of works are aimed at studying the relationship of innovative approaches in economics and education (Ridiger & Gutsynyuk, 2019; Hemelt et al., 2021), among which we can single out the study of the main problems of Russian economy innovative development, which is associated with an insufficiently high assessment of the science and innovation role, a low level of research personnel potential, insufficient research funding (Bessonova & Battalov, 2019).

The issues of education funding in developed countries are quite popular among scientists since funding in these countries differs significantly. Investment in the educational process is viewed as a factor in sustainable economic development (Ershova et al., 2019). The research of the various education programs funding, innovative developments takes a separate place in science (Sud et al., 2021; Egan et al., 2021). Graddy-Reed et al. (2021) presents the impact of independent funding on the innovation productivity by graduate students in various branches of science (mathematics, physics, engineering, psychology, sociology).

Tao & Greenwood (2020) present the relationship between monitoring financial reporting in higher education institutions and their quality. The study was performed based on discretionary charges in a non-commercial environment, which allowed determining the effectiveness of monitoring and innovative approaches for regulating this process.

The role of human resources in the development of managers' strategic thinking on the use of opportunities is presented in the work of Tajpour et al. (2018); and the work of Salamzadeh et al. (2019) presents the impact of human resources on corporate entrepreneurship.

Among the studies, it is possible to highlight Kundu & Matthews' (2019) research of the sponsoring organizations classification, among which charities received an important place, since they provide an investment resource for specifically established goals.

Based on this, there is a significant amount of research in the field of the educational sphere funding, but this work focuses on the analysis of the transformation processes that affect the improvement of the education quality and the economy as a whole.

METHODOLOGY

According to the authors of this research, the works abovementioned unfortunately do not give full answers to such a basic question as if the current rate of increase in the financial volume of research joint interstate work will continue in subsequent years, who will become the leader in them, if the volumes of joint work between Russia and China are currently maximum, optimal or minimal, and if there is also opportunity for further growth of this indicator. Answers to these questions will enable the financial organizations to fund Russian scientific organizations more systematically, optimally in the field of performance comparisons and strategically precise. In connection with the identified shortcomings in the works abovementioned, as well as the importance and relevance of this issue at the present stage, the following research methods were set in this paper to implement the goal of the research:

- Identification of the sanctions role in changing the role of countries in interstate scientific and technical cooperation.
- Determination of the leading countries in the field of scientific interaction with the scientific sector of Russia from 2014 to the present, and their priorities.
- Identifying prospects for the situation development for a 10 years period according to the composition of the main partner countries for scientific cooperation with the financial component.

During the research, the authors performed general theoretical and analytical methods. Using the method of analysis, the authors managed to identify the main sources of funding for the Russian educational system, and to identify the most significant competitors in funding.

During the research, no restrictive norms were envisaged, since the work is not directly related to a sociological survey, and to the introduction of people and animals into the research. This article focuses on the compliance of all moral norms with scientific articles. There are no copyright infringements. All graphs and tables are based on available sources, using analytical research methods.

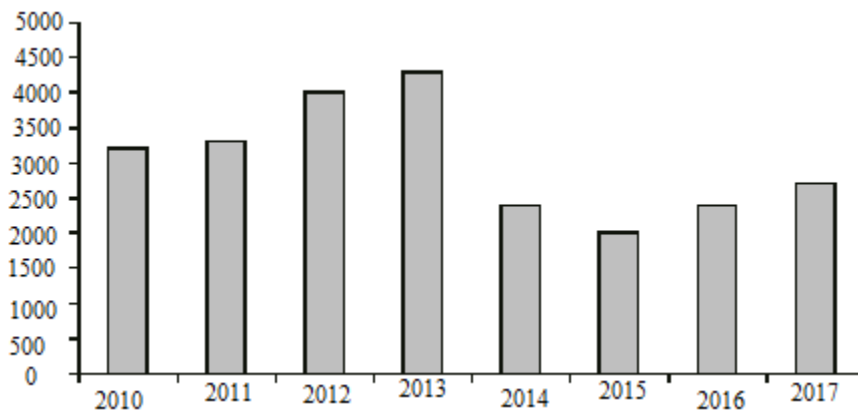
RESULTS AND DISCUSSION

In this research work a comparative analysis was performed concerning the financial indicators of the international scientific and educational cooperation between higher educational institutions and scientific institutions under the Ministry of Science and Higher Education (formerly the Ministry of Education and Science of Russia) in the pre-sanction and sanction periods of years, from 2010 to 2017. From the Table 1 data for 2010, we see that the United States of America was the main partner in funding research of universities and research institutions subordinate to the Ministry of Education and Science of the Russian Federation from foreign sources. The leading today partner of the Russian Federation in many areas, the People's Republic of China, was not even in the top five, occupying only the 7th rating position. It is worth noting here that this happened not only through the fault of China. Russia often was not ready to actively develop the "*Eastern vector*" in those years, believing that the main "*understandable*" scientific partners could be countries from the Western world, primarily from the countries of the European Union and the United States of America. Moreover, quite often in the participants' composition there are emigrants from Russia or researchers working simultaneously for two countries, executors of such joint projects.

| Country | Scientific and educational activities funding in 2010 (million rubles) |
|----------------|---|
| USA | 217, 4 |
| FRG | 108, 8 |
| Great Britain | 105, 7 |
| France | 96, 4 |
| Finland | 72, 6 |

Source: Authors' Compilation.

In the subsequent pre-sanction's years, the composition of the participants in the leading countries remained almost unchanged, while the volumes of received funds increased steadily. However, in 2014 the situation has changed. Moreover, in order to have a meaningful understanding of the problem, the data in Figure 1 are presented in US dollars; and accordingly, the sharp decline in the price of the ruble against the dollar that occurred in December 2014 might not reflect completely the essence of the phenomenon.



Source: Authors' Compilation

FIGURE 1
AMOUNT OF FUNDS FOR SCIENTIFIC RESEARCH RECEIVED UNDER CONTRACTS AND GRANTS FROM FOREIGN SOURCES (IN THOUSANDS OF \$)

Here, of course, it is worth mentioning that this phenomenon arose not so much because of the sanction wars between the countries of the West and Russia. Most of the joint research projects in these years were not scrapped to at all. For example, the pan-European Seventh Framework Program (FP7), renamed Horizon 2020 in 2014, initially assumed that Russia was now a well-off country and, accordingly, its leadership should pay for its participation in the shared format, and not in full funding of this European fund and its participants from the EU countries as in previous years. At the same time, in parallel with this, investors from the People's Republic of China began to come into this field, both in the world as a whole and in Russia in particular. And according to the results of 2013-2017, if we consider the entire amount of such funds received, the United States with almost 1.5 billion rubles remained the main partner in total, with a China's underrun by 530 million rubles. However, according to the initially

collected data, this underrun was reduced significantly in subsequent years by the time of the article writing. The following 3-5 places were retained by the same players, with the exception of France. The situation change for these years is presented in more detail in Table 2.

| Country | Funding volumes (in million rubles) and the place in the rating | | | | | | | | | |
|---------------|---|----|------|----|------|-----|------|----|------|----|
| | 2013 | No | 2014 | No | 2015 | No | 2016 | No | 2017 | No |
| USA | 266 | 1 | 345 | 1 | 301 | 1 | 378 | 1 | 203 | 2 |
| PRC | 148 | 2 | 97 | 5 | 101 | 4/5 | 157 | 2 | 463 | 1 |
| FRG | 102 | 5 | 145 | 2 | 132 | 3 | 127 | 4 | 107 | 5 |
| Great Britain | 114 | 3 | 103 | 4 | 156 | 2 | 131 | 2 | 109 | 3 |
| Finland | 101 | 6 | 125 | 3 | 101 | 4/5 | 83 | 5 | 56 | 6 |

Source: Authors' Compilation

The positions of the People's Republic of China in matters of investments in Russian science were quite significant by the end of the pre-sanction period, but at that time they were of different nature, more of a multi-state scientific cooperation. In the early years of the sanction wars, scientific cooperation with China weakened in China. However, by 2016, it had returned to the pre-sanction positions, and due to the victory of Donald Trump in the US elections (which, unlike Barack Obama, began to voice Sinophobia theses from the first days of his Presidency), it increased almost three times (Shanin & Shanina, 2016). In subsequent years, when the United States launched programs of unfair economic wars against such China's tech giants as Huawei and ZTE, China's investments in Russian science became even radically higher than the ones of other rival countries (Fetisova & Fetisov, 2019; Shinyaeva & Slepova, 2019). However, there are certain forecasts that despite the fact that many countries of the European Union are already formulating theses that they are ready to try to regain their leading places in this matter, their further lag behind the leader will increase and, moreover, perhaps subsequent places in the rating may go to Asian countries, primarily to South Korea, and under certain circumstances even to Vietnam, India, Japan, Taiwan (in statistics, it is often considered separately from the PRC, despite the fact that Russia recognizes this temporarily independent island as the 23rd County of the PRC, like almost all countries in the world).

To achieve this goal, the authors have developed the following recommendations. There is a need to:

- Identify clear elements of the educational institution that require funding and improvement. When forming priority elements, it is necessary to pay attention to all elements of the educational process from classrooms, highly qualified specialists to reagents, modern technologies that contribute to the formation of quality education.
- Identify the risks that may arise in the funding process.
- Study all possible sources of funding and choose the most significant and effective ones, since this will directly contribute to the education development and in the future, to the formation of qualified specialists.
- Ensure the improvement of the legislative system of in the field of educational programs funding to enable universities to choose the most priority areas requiring funding. For example, initially funds were allocated for the purchase of new computers, but during this period a graduate student was

conducting laboratory research requiring urgent funding, which in the future will affect science. The system should be designed in such a way that the management of the universities was able to dispose of funds in a priority direction, but in the future to receive benefits several times.

- Attract to funding process not only budget funds, but also commercial resources.

As a result of the financial indicators analysis of international scientific and educational cooperation, the authors found that in developed countries, monetary investments in education are constantly growing, which is associated with economic needs. Education contributes to the influence on all spheres of activity; therefore, the issues of educational institution high-quality funding or grant development are relevant today and require integration processes, both at the expense of public funds and external sources. The novelty of the work lies in determining the transformation of educational services funding from foreign sources into education in Russia and changing the amount of funds depending on the economic situation. In addition, the authors provided recommendations that will contribute to the required level of funding for educational institutions.

CONCLUSION

As part of the study, based on statistical and analytical work, the authors have identified the leading countries in financial support of Russian scientific research institutions since 2010 to the present. The garland of victory has moved from the USA to China by a significant margin in the last few years. The research found that the current partner of research funding for universities in the Russian Federation, the People's Republic of China, was not even in the top five in 2010, ranking only 7th on the list. And before the sanctions period, the issues of investing in the Russian universities' science provided for multi-level scientific cooperation at the state level.

The paper formulates prospects of further development in this direction, with the outgoing from the list of leading countries in external funding of Russian science from the USA and the EU to the countries of the Asian continent. Financial state support for joint Russian-American and Russian-European programs continue to remain an important point in this direction nowadays, and undoubtedly, remain promising for the subsequent development of interstate scientific cooperation of the Russian Federation. But more priority today, according to the authors of this study, is financial flows restructuring to support Russia's interstate projects with the countries of the Asian continent, as more promising and less risky in issues of the foreign policy influence. The obtained results of the research will be useful for the educational institutions management in order to connect external investments for the formation of a high-quality educational process, since the education level directly affects the country's economy.

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